AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Original): A tensile specimen comprising:

an axisymmetric first end section;

an axisymmetric second end section; ~~and~~

an axisymmetric gauge section positioned centrally between said axisymmetric first end section and said axisymmetric second end section, wherein said axisymmetric first end section adjoins said axisymmetric gauge section by a first variable curvature transition fillet, and wherein said axisymmetric second end section adjoins said axisymmetric gauge section by a second variable curvature transition fillet, wherein said tensile specimen has a surface stress concentration factor close to unity (1.0);

a first threaded portion positioned substantially near a free end of said axisymmetric first end section; and

a second threaded portion positioned substantially near a free end of said axisymmetric second end section;

wherein a maximum said surface stress concentration factor is 1.01, a length of said MAST specimen is 1.0 inch and a diameter of said axisymmetric gauge section is 0.080 inch.

2. (currently amended): ~~The~~ A tensile specimen ~~according to claim 1,~~ comprising:

an axisymmetric first end section;

an axisymmetric second end section; and

an axisymmetric gauge section positioned centrally between said axisymmetric first end section and said axisymmetric second end section, wherein said axisymmetric first end section adjoins said axisymmetric gauge section by a first variable curvature transition fillet, and wherein said

axisymmetric second end section adjoins said axisymmetric gauge section by a second variable curvature transition fillet, wherein said tensile specimen has a surface stress concentration factor close to unity (1.0);

a first collet positioned substantially near a free end of said axisymmetric first end section, wherein said first collet adjoins said free end of said axisymmetric first end section by a first shoulder; and

a second collet positioned substantially near a free end of said axisymmetric second end section, wherein said second collet adjoins said free end of said axisymmetric second end section by a second shoulder;

wherein a maximum said surface stress concentration factor is 1.01, a length of said MAST specimen is 1.0 inch and a diameter of said axisymmetric gauge section is 0.042 inch.

3. (Original): The tensile specimen according to claim 2, having a first load transfer region defined by said first

shoulder and said axisymmetric first end section, and a second load transfer region defined by said second shoulder and said axisymmetric second end section wherein said first shoulder and said second shoulder are oversized load bearing shoulders which eliminate the possibility of a bearing stress-induced fracture within the first load transfer region and the second load transfer region prior to failing said axisymmetric gauge section.

4.-7. (cancelled).

8. (Original): The tensile specimen according to claim ~~1~~ 2, wherein uniform axial stress fields exist within and adjacent to said axisymmetric gauge section.

9. (cancelled).

10. (Original): A tensile specimen test setup comprising:

a tensile specimen having:

an axisymmetric first end section;

an axisymmetric second end section; and

an axisymmetric gauge section positioned centrally between said axisymmetric first end section and said axisymmetric second end section, wherein said axisymmetric first end section adjoins said axisymmetric gauge section by a first variable curvature transition fillet, and wherein said axisymmetric second end section adjoins said axisymmetric gauge section by a second variable curvature transition fillet, wherein said tensile specimen has a surface stress concentration factor close to unity (1.0);

a first test block attached to said axisymmetric first end section of said tensile specimen;

a second test block attached to said axisymmetric second end section of said tensile specimen; and

an electrical apparatus electrically joined to said first test block and said second test block, wherein said electrical apparatus records voltage, current, impedance and resistance of said tensile specimen while said tensile specimen is tested.

11. (Original): The tensile specimen test setup according to claim 10, wherein said tensile specimen further comprises:

a first collet located substantially near a free end of said axisymmetric first end section, wherein said first collet adjoins said free end of said axisymmetric first end section by a first shoulder; and

a second collet located substantially near a free end of said axisymmetric second end section, wherein said second collet adjoins said free end of said axisymmetric second end section by a second shoulder, wherein said first test block is adapted to receive said collet of said axisymmetric first end section and said second test block is adapted to receive said collet of said axisymmetric second end section.

12. (Original): The tensile specimen test setup according to claim 10, further comprising:

a first threaded portion positioned substantially near a free end of said axisymmetric first end section; and

a second threaded portion positioned substantially near a free end of said axisymmetric second end section;

wherein said first test block is adapted to receive said threaded portion of said axisymmetric first end section and said second test block is adapted to receive said threaded portion of said axisymmetric second end section.

13. (Original): A method of testing a piezoelectric material comprising:

preparing a sample from a piezoelectric material;

mounting said sample to a mounting apparatus;

joining electrical measurement apparatus to said sample by said mounting apparatus;

subjecting said sample to axial forces until failure;

measuring elongation of said sample during said step of subjecting;

measuring axial forces on said sample during said step of subjecting;

measuring electrical properties of said sample during said step of subjecting; and

examining said sample after failure.

14. (Original): The method of claim 13, wherein subjecting said sample to axial forces until failure comprises causing contraction of said sample by providing an electrical current to said sample.

15. (Original): The method of claim 14, wherein said electrical current is provided to said sample cyclically to cause cyclical contractions.

16. (Original): The method of claim 13, wherein subjecting said sample to axial forces is performed mechanically.

17. (Original): The method of claim 13, wherein preparing said sample from said piezoelectric material comprises:

growing a crystal of said piezoelectric material; and

machining a cylindrical tensile test specimen from said crystal.

18. (Original): The method of claim 17, wherein machining said tensile test specimen comprises:

using a numerically controlled lathe to radially scribe said tensile test specimen such that a surface of said tensile test specimen has a surface stress concentration factor near unity; and

polishing said surface of said tensile test specimen.

19. (Original): The method of claim 17, wherein machining said tensile test specimen comprises using a numerically controlled machine to axially scribe said tensile test specimen such that a surface of said tensile test specimen has a surface stress concentration factor near unity.